

PATENT COOPERATION TREATY

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INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2005/004721

International filing date (day/month/year)
10.03.2005

Priority date (day/month/year)
11.03.2004

International Patent Classification (IPC) or both national classification and IPC
H04N7/36, H04N7/26, H04N7/50

Applicant
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1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2005/004721

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2005/004721

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-29
Inventive step (IS)	Yes: Claims	
	No: Claims	1-29
Industrial applicability (IA)	Yes: Claims	1-29
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1 Reference is made to the following documents:

- D1: ZHANG X-D ET AL: "Dynamic selection and effective compression of key frames for video abstraction" PATTERN RECOGNITION LETTERS, NORTH-HOLLAND PUBL. AMSTERDAM, NL, vol. 24, no. 9-10, June 2003 (2003-06), pages 1533-1542, XP004410690 ISSN: 0167-8655
- D2: SIKORA T: "MPEG STANDARDS SECTION 1 DIGITAL VIDEO CODING STANDARDS" DIGITAL CONSUMER ELECTRONICS HANDBOOK, 1997, pages 803-823,I, XP001059402
- D3: TUDOR P N: "TUTORIAL MPEG-2 VIDEO COMPRESSION" ELECTRONICS AND COMMUNICATION ENGINEERING JOURNAL, INSTITUTION OF ELECTRICAL ENGINEERS, LONDON, GB, vol. 7, no. 6, December 1995 (1995-12), pages 257-264, XP000545121 ISSN: 0954-0695
- D4: EP-A-0 658 057 (SHARP KABUSHIKI KAISHA) 14 June 1995 (1995-06-14)

2 INDEPENDENT CLAIMS 1, 16

- 2.1** The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Any of the documents D1 and/or D2 discloses (the references in parentheses applying to these documents):

an encoding apparatus for encoding images of frames, which form a moving image by motion compensation (see D1 page 1525, left-hand column, lines 28-32, see D2 figure 8.5),

comprising

input means for inputting images of frames (see D1 page 1525, left-hand column, lines 46-48, see D2, figure 8.5);

section division means for dividing the frames into a plurality of sections on the basis of the images of the frames input by said input means (see D1 page 1525, right-hand column, lines 45-47, see D2 paragraph 8.3.3 where a section of images is an I frame and all the P and B frames that depend on it);

representative image setting means for setting one representative image that represents the image of each frame in each of the sections divided by said section division means (see D1 page 1525, right-hand column, lines 45-47, see D2 paragraph 8.3.3 where a representative frame is an I frame); and

reference image selection means for selecting one representative image to be referred to as to encode an image of a frame of interest from the representative images set for respective sections (see D1 page 1526, right-hand column, lines 29-31, see D2, paragraph 8.3.3 where for each P and B image a reference image is selected), and

in that the image of the frame of interest is encoded by motion compensation using the images of the frames in the section that includes the representative image selected by said reference image selection means (see D1 page 1526, right-hand column, lines 29-31, see D2, paragraph 8.3.3 where each P or B frame is coded using the I frame or a P frame of the same section).

Therefore, claim 1 as defined is not distinguishable from D1 and/or D2. Thus, the subject matter of claim 1 is not new (Article 33(2) PCT).

2.2 The same arguments apply, mutatis mutandis, to the corresponding coding method claim 16, which is thus not novel (Article 33(2) PCT).

3 INDEPENDENT CLAIMS 2,11,17,19

3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 2 is not new in the sense of Article 33(2) PCT.
Any of the documents D1 and/or D2 discloses (the references in parentheses

applying to this documents):

an encoding apparatus for encoding images of frames, which form a moving image by motion compensation (see D1 page 1525, left-hand column, lines 28-32, see D2, figure 8.5),

comprising

input means for inputting images of frames (see page 1525, left-hand column, lines 46-48, see D2, figure 8.5);

section division means for dividing the frames into a plurality of sections on the basis of the images of the frames input by said input means (see D1 page 1525, right-hand column, lines 45-47, see D2 paragraph 8.3.3 where a section of images is an I frame and all the P and B frames that depend on it);

representative image setting means for setting one representative image that represents the image of each frame in each of the sections divided by said section division means (see D1 page 1525, right-hand column, lines 45-47, see D2 paragraph 8.3.3 where a representative frame is an I frame); and

reference image selection means for selecting one representative image to be referred to as to encode an image of a frame of interest from the representative images set for respective sections (see D1 page 1526, right-hand column, lines 29-31, see D2, paragraph 8.3.3 where for each P and B image a reference image is selected), and

in that the image of the frame of interest is encoded by motion compensation using the representative image selected by said reference image selection means (see D1 page 1526, right-hand column, lines 29-31, see D2, paragraph 8.3.3, page 8.15 where each P frame is coded using the I frame of the same section).

Therefore, claim 2 as defined is not distinguishable from D1 and/or D2. Thus, the

subject matter of claim 2 is not new (Article 33(2) PCT).

- 3.2 The same arguments apply, mutatis mutandis, to the corresponding decoding apparatus claim 11, to the corresponding coding method claim 17, and to the corresponding decoding method claim 19, which are thus not novel (Article 33(2) PCT).

4 INDEPENDENT CLAIMS 10,18

- 4.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 10 is not new in the sense of Article 33(2) PCT.
Any of the documents D1 and/or D2 discloses (the references in parentheses applying to this documents):

an encoding apparatus for encoding images of frames, which form a moving image by motion compensation (see D1 page 1525, left-hand column, lines 28-32, see D2, figure 8.5),

comprising

input means for inputting images of frames (see D1 page 1525, left-hand column, lines 46-48, see D2, figure 8.5);

representative image setting means for setting one representative image that represents the image of each frame in each of the sections divided by said section division means (see D1 page 1525, right-hand column, lines 45-47, see D2, paragraph 8.3.3 where a representative frame is an I frame); and

output means for outputting encoded results of the images input by said input means together with information required to specify the representative image (see page 1526, right-hand column, lines 27-31 see D2, figure 8.5).

Therefore, claim 10 as defined is not distinguishable from D1 and/or D2. Thus, the subject matter of claim 10 is not new (Article 33(2) PCT).

- 4.2 The same arguments apply, *mutatis mutandis*, to the corresponding coding method claim 18, which is thus not novel (Article 33(2) PCT).

5 INDEPENDENT CLAIMS 12,20

- 5.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 12 is not new in the sense of Article 33(2) PCT.

Document D3 discloses (the references in parentheses applying to this document):

an encoding apparatus for encoding images of frames, which form a moving image by motion compensation (see figure 2),

comprising

input means for inputting images of frames (see figure 2);

setting means for setting an image of a frame input at a predetermined cycle of the images of the frames input by said input means as an image of a representative frame (see paragraph "Picture types" on page 261 and in particular the right-hand column where it is disclosed that an I picture appears every N pictures);

switching means for switching an encoding method depending on whether or not a frame to be encoded is a representative frame (see paragraph "Picture types" on page 261 and in particular the left-hand column); and

output means for outputting encoded results of the images of the frames input by said input means together with information required to specify the representative frame (see figure 2).

Therefore, claim 12 as defined is not distinguishable from D3. Thus, the subject matter of claim 12 is not new (Article 33(2) PCT).

- 5.2 The same arguments apply, *mutatis mutandis*, to the corresponding coding method claim 20, which is thus not novel (Article 33(2) PCT).

6 INDEPENDENT CLAIMS 13,21

- 6.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 13 is not new in the sense of Article 33(2) PCT.
Document D4 discloses (the references in parentheses applying to this document):

an encoding apparatus for encoding images of frames, which form a moving image by motion compensation (see page 2, lines 5-6, and figure 9),

comprising

input means for inputting images of frames (see figure 9, numeral 901);

calculation means for calculating a difference between an image of a frame input by said input means and a decoded image obtained by decoding a result of encoding the image of the frame (see page 3, lines 1-9, and figure 10);

determination means for determining an image of a frame having a smallest difference of the differences calculated by said calculation means for the frames for the predetermined number of frames as a representative image that represents the images of the frames for the predetermined number of frames (see page 5, lines 9-12); and

output means for outputting encoded results of the images of the frames input by said input means together with information required to specify the representative frame (see figure 10, numeral 905).

Therefore, claim 13 as defined is not distinguishable from D4. Thus, the subject matter of claim 13 is not new (Article 33(2) PCT).

- 6.2 The same arguments apply, *mutatis mutandis*, to the corresponding coding method claim 21, which is thus not novel (Article 33(2) PCT).

7 INDEPENDENT CLAIMS 14,22

- 7.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 14 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (the references in parentheses applying to this document):

an encoding apparatus for encoding images of frames, which form a moving image by motion compensation (see page 1525, left-hand column, lines 28-32),

comprising

input means for inputting images of frames (see page 1525, left-hand column, lines 46-48, where an image of a frame is a key frame);

storage means for storing an image of a representative frame to be referred to when inter-frame encoding is applied to an input image input by said input means (see page 1526, left-hand column, lines 29-32);

calculation means for calculating similarity levels of images stored in said storage means with the input images (see page 1526, left-hand column, equation (2));

storage control means for, when a minimum similarity level of the similarity levels calculated by said calculation means for the images stored in said storage means is not less than a predetermined value, storing the input image in said storage means as a representative frame (page 1526, left-hand column, lines 34-41); and

output means for outputting encoded results of the images of the frames input by said input means together with information required to specify the representative frame (see page 1526, right-hand column, lines 27-31).

Therefore, claim 14 as defined is not distinguishable from D1. Thus, the subject matter of claim 14 is not new (Article 33(2) PCT).

7.2 The same arguments apply, mutatis mutandis, to the corresponding coding method claim 22, which is thus not novel (Article 33(2) PCT).

8 INDEPENDENT CLAIMS 15,23

8.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 15 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (the references in parentheses applying to this document):

an encoding apparatus for encoding images of frames, which form a moving image by motion compensation (see page 1525, left-hand column, lines 28-32),

comprising

input means for inputting images of frames (see page 1525, left-hand column, lines 46-48, where an image of a frame is a key frame);

storage means for storing an image of a representative frame to be referred to when inter-frame encoding is applied to an input image input by said input means (see page 1526, left-hand column, lines 29-32);

motion vector calculation means for calculating motion vectors with the input image for images stored in said storage means (see page 1526, left-hand column, equation (2));

calculation means for calculating errors of the motion vectors calculated by said

motion vector calculation means for the images stored in said storage means (see page 1526, left-hand column, equation (2));

storage control means for, when a minimum error of the errors calculated by said calculation means for the images stored in said storage means is not more than a predetermined value, storing the input image in said storage means as a representative frame (page 1526, left-hand column, lines 34-41); and

output means for outputting encoded results of the images of the frames input by said input means together with information required to specify the representative frame (see page 1526, right-hand column, lines 27-31).

Therefore, claim 15 as defined is not distinguishable from D1. Thus, the subject matter of claim 15 is not new (Article 33(2) PCT).

- 8.2 The same arguments apply, mutatis mutandis, to the corresponding coding method claim 23, which is thus not novel (Article 33(2) PCT).

9 DEPENDENT CLAIMS 3-9, 24-29

Dependent claims 3-9 and 24-29 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT), the reasons being as follows:

Claims 3-9:

The additional technical features of claims 3-9 are disclosed in prior art D1 (see page 1526, left-hand column, lines 29-41);

Claims 24-29

The additional feature of a computer storing and executing the methods of claims 16, 19 and 20 is trivial in the field of MPEG technology.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/JP2005/004721